



Radar level gauge with antenna arrangement for improved radar level gauging

FIELD OF THE INVENTION

[0001] The present patent application relates to a radar level gauge with antenna arrangement for improved radar level gauging. The present patent application further relates to a method for improved radar level gauging using such a radar level gauge. The invention provides improved gauging sensitivity at small distances and any disturbances of a weak surface echo by any internal echoes will be minimized.

BACKGROUND OF THE INVENTION

[0002] Radar level gauging in all kinds of tanks has found a steadily increasing use since the mid-seventies. The extension of the use to more diversified applications has posed a number of challenges on the design of radar level gauges.

[0003] Obvious basic functions for all radar level gauges are sealing of the tank, which may hold high pressure, dangerous contents etc., and sealing of the enclosure protecting the electronics of the radar level gauge, at least for outdoor environments applications and sometimes for open sea applications etc. The enclosure for the electronics is many times also determined by regulations for explosion protection related to electric equipment. This is all standard technology but a characteristic need for radar level gauges is an electrical (microwave) connection from the radar electronics to the antenna.

[0004] Coaxial connections and waveguides are used presently for this microwave connection. At least one microwave joint is usually provided in this microwave connection, for instance to be able to replace a faulty electronic unit while the tank is pressurized. The microwave joint is a critical part during field replacements.

[0005] Coaxial connectors are manufactured as standard items including sealed parts etc. and thus frequently used in radar level gauges. Field experience however is that the tiny connectors, which are necessary for high frequency use, may easily be damaged during handling outside of laboratory environments and that they will degrade severely if even a very small amount of water, a 0.1 mm layer or less, or dirt is trapped

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